significant when compared to the standard error of the difference, 0.0478 inch.

These data, which include 933 measurements of 311 precipitation days on the Priest River Experimental Forest and 38 measurements of 19 precipitation days on the Bent Creek Experimental Forest, show that the inexpensive Forest Service type rain gage is entirely dependable for all ordinary measurements of rainfall where large capacity or automatic recording is not required. Other factors such as topography and obstructions surrounding the instrument exposure may introduce deviations and errors far greater than those caused by the design or low cost of the Forest Service gage.

During the emergency caused by the war this smaller gage has other features to recommend it. It contains only a fraction of the amount of brass and iron that is required by the larger gages, and it can be built by any competent tinsmith.

PRELIMINARY REPORT ON TORNADOES IN THE UNITED STATES DURING 1942

By J. L. BALDWIN

[Weather Bureau, Washington, February 1943]

These tabulations are derived from data on "Severe Local Storms" appearing in the MONTHLY WEATHER REVIEW and in the monthly Climatological Data of the different Sections of the United States. They show the approximate monthly and annual number of tornadoes and the deaths, injuries, and property damage caused by them in the States and the country as a whole. Table 1 is a tabulation of known tornadoes and table 2 of possible tornadoes. A final and more complete report will appear in the United States Meteorological Yearbook, 1942.

Tornadoes during 1942 were normal in many respects. The greatest number in the United States for any month was 31 in May, which is almost exactly normal in respect to time and number. It is also noted that the total number reported for the year was 132, or 153 if we include the possible tornadoes, against a 27-year average of about 140; furthermore, the total damage produced by these twisters was tabulated as $11,818,400, or approximately normal.

The greatest human loss for any month was 111 killed and 781 injured in March, followed by 86 killed and 444 injured in April, while during July, August, September, and November no deaths were reported and only 3 injuries. The 335 deaths for 1942 exceeded the annual average of 265. There were 114 deaths and over 250 injuries in Oklahoma and 66 deaths and 527 injuries in Mississippi. Almost one-half of the total number of tornadoes, deaths, and property losses occurred in the four States of Kansas, Oklahoma, Texas, and Iowa.

The greatest monthly property loss, approximately $3,862,000, occurred in April of which amount $2,015,000 was at Pryor, Okla., on the 27th and $1,500,000 at Crowell, Tex., on the 28th.

The most severe tornado during 1942 and one of the most disastrous ever to strike Oklahoma occurred at Pryor, Mayes County, at 3:45 p. m., April 27. It moved northeastward over an area one-fourth mile wide and about 20 miles long. The center passed over the principal business section of the city of Pryor, demolishing dozens of frame buildings and several brick and stone buildings. Torrential rains and some hail accompanied it. The American Red Cross reported 52 killed and 181 treated for injuries. Property damage was estimated at $2,000,000. Another very severe tornado struck the southwestern suburbs of Oklahoma City at about 8:41 p. m., June 12. It dropped suddenly to the surface, moved slowly southeastward for 200 or 300 feet, curved to the southwest for another few hundred feet, recurved to the east for a short distance, then curved north, describing almost a semicircle before beginning its westward movement. Its translation was markedly slow. Very little rain and no hail accompanied the storm, but much mud was present in the funnel cloud. It caused 35 deaths, 29 serious injuries, and destroyed 73 homes and damaged 31 others. A detailed technical study of the Pryor and other recent tornadoes was prepared by the Forecast District at Kansas City, Mo.

A very destructive tornado also occurred at Crowell, Foard County, Tex., at about 9:30 p. m., April 28. It moved from the northwest, killing 11 people, injuring 250, and destroying property estimated at $1,500,000 in an area 1 by 3 miles, principally within the city of Crowell. Another severe tornado struck Berryville, Ark., at 10:30 p. m., October 29, killing 29 people, injuring over 100, and destroying 137 homes and other buildings and damaging 65 more.

The Guymon, Okla., tornado traveled from northeast to southwest contrary to the usual movement of tornadoes. Unusual movements were also noted in a few other cases, and especially by the Oklahoma City tornado mentioned above. Some of these tornado clouds traveled in series or on parallel routes during general storms and some did not reach the ground or only in places. It is interesting to note that the least destructive tornadoes reported during the year were 8 funnel clouds observed in Kansas during August in connection with 3 storms. They produced practically no damage, and it is stated that 7 of these funnel clouds did not reach the ground and that 6 of these 7 were observed extending down from the same storm cloud.

Some excellent pictures of the Lake Park, Iowa, tornado of May 30 and notes on the causes of destructive local storms are published in the Iowa section, Climatological Data of June 1942. These observed conditions agree with J. R. Lloyd's conclusion that "tornadoes appear to occur only in connection with upper-air cold fronts," and other deductions presented in his investigations that were published in the REVIEW of April 1942, under the title, "The Development and Trajectories of Tornadoes."

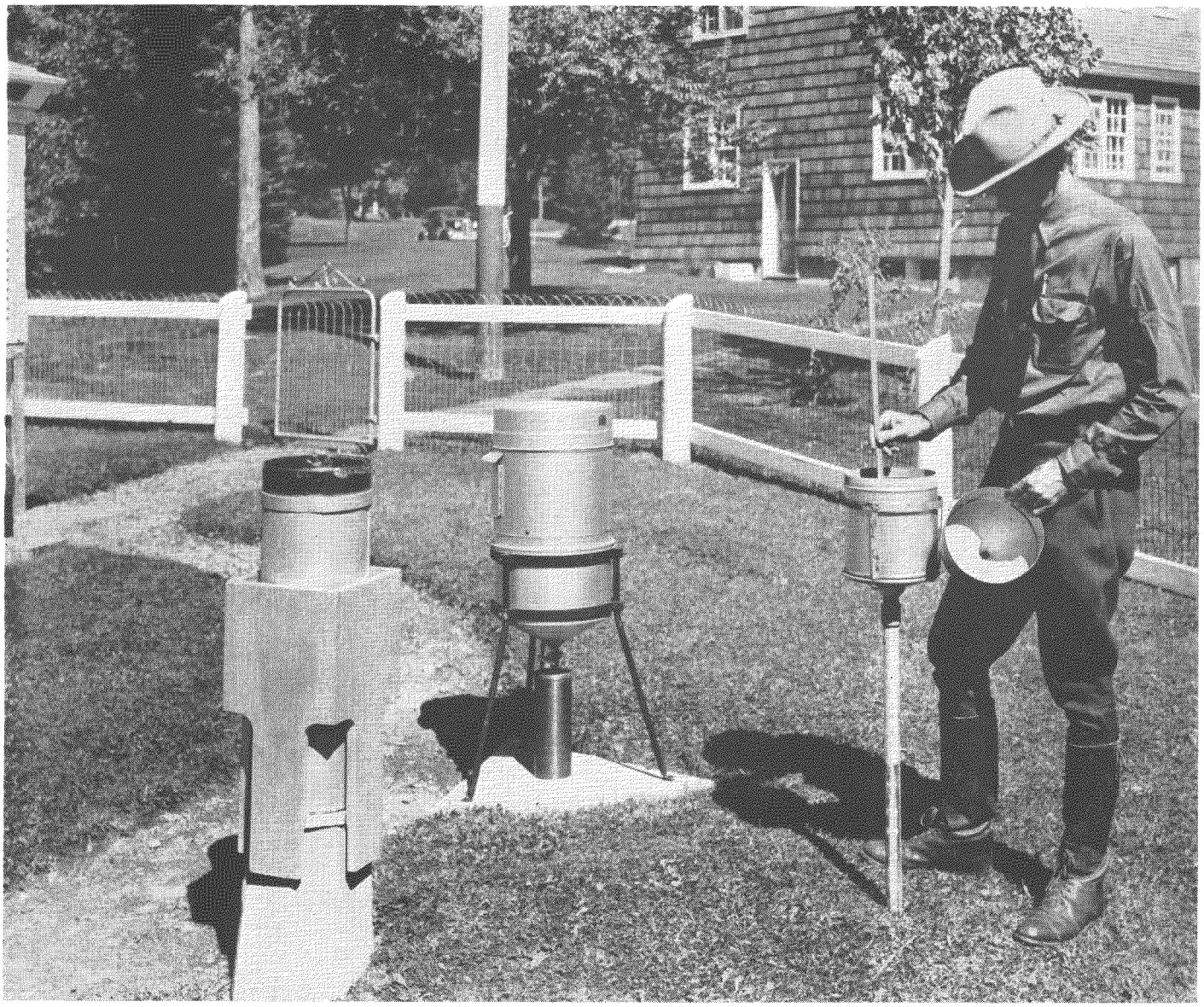

FIGURE 1.—Arrangement for comparison of the Weather Bureau standard (left), tipping-bucket (center), and Forest Service (right) types of rain-gages at the Priest River Experimental Forest headquarters

TABLE 1.—*Tornadoes and probable tornadoes*

Stations	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Alabama:													
Number	2												2
Deaths	1												1
Injuries	12												12
Damage ($ x 1,000)	22.0												22.0
Arkansas:													
Number		[2]3								2			[2]5
Deaths		7								29			36
Injuries		70								[2]100			[2]170
Damage ($ x 1,000)		1,750.0								515.0			2,265.0
Colorado:													
Number				2		2							4
Deaths				4		0							4
Injuries				(4)		0							(4)
Damage ($ x 1,000)				50.0		10.3							60.3
Florida:													
Number	1												1
Deaths	0												0
Injuries	5												5
Damage ($ x 1,000)	15.0												15.0
Illinois:													
Number			3				3						6
Deaths			20				0						20
Injuries			[2]125				2						[2]127
Damage ($ x 1,000)			825.0				[2]671.5						[2]1,496.5
Indiana:													
Number			3			3							6
Deaths			2			4							6
Injuries			[2]40			(4)							[2]40
Damage ($ x 1,000)			701.0			507.5							1,208.5
Iowa:													
Number					[2]1	9	[2]3						[2]13
Deaths					0	1	0						1
Injuries					(3)	6							[2]6
Damage ($ x 1,000)					50.0	[2]70.0	[2]30.0						150.0
Kansas:													
Number				4	8	4	1	8			1		26
Deaths				15	3	4	0	0			0		22
Injuries				(4)	(4)	(4)	0	0			0		(4)
Damage ($ x 1,000)				104.0	536.0	124.5	0.2	[2]0			2.5		767.2
Kentucky:													
Number			1										1
Deaths			24										24
Injuries			108										108
Damage ($ x 1,000)			312.0										312.0
Louisiana:													
Number						1							1
Deaths						0							0
Injuries						0							0
Damage ($ x 1,000)						0.5							0.5
Minnesota:													
Number				2	3	2							7
Deaths				2	0	0							2
Injuries				7	(4)	0							[2]7
Damage ($ x 1,000)				80.0	170.7	11.2							261.9
Mississippi:													
Number		1	[2]1										[2]2
Deaths		1	[2]65										[2]66
Injuries		27	500										527
Damage ($ x 1,000)		(5)	(5)										(5)
Missouri:													
Number					1								1
Deaths					0								0
Injuries					0								0
Damage ($x1,000)					5.0								5.0
Nebraska:													
Number				2	[2]4	1							[2]7
Deaths				0	6	0							6
Injuries				0	(3)	1							(3)
Damage ($x1,000)				33.0	[7]200.0	10.0							[7]243.0
North Carolina:													
Number												1	1
Deaths												1	1
Injuries												30	30
Damage ($x1,000)												45.0	45.0
Oklahoma:													
Number	1	1	1	4	5	1				1		1	15
Deaths	0	1	0	52	26	35				0		0	114
Injuries	1	5	1	[2]181	[2]33	[2]29				0		(7)	[2]250
Damage ($x1,000)	2.0	10.0	30.3	2,015.0	[7]350.0	300.0				0.4		(6)	[2]2,707.7
South Carolina:													
Number			1		1							3	5
Deaths			0		0							1	1
Injuries			7		0							6	13
Damage ($x1,000)			25.0		2.0							31.0	58.0
South Dakota:													
Number				2	1	1							4
Deaths				2	0	0							2
Injuries				6	0	0							6
Damage ($x1,000)				20.0	10.0	5.5							35.5
Tennessee:													
Number	1												1
Deaths	1												1
Injuries	1												1
Damage ($x1,000)	25.0												25.0
Texas:													
Number	[1]1			2	3							5	11
Deaths	7			11	0							5	23
Injuries	1			250								(4)	[2]251
Damage ($x1,000)	(5)			1,500.0	50.0							145.0	[2]1,695.0
Virginia:													
Number									1				1
Deaths									0				0
Injuries													
Damage ($x1,000)									5.0				5.0

See footnotes at end of table.

TABLE 1.—*Tornadoes and probable tornadoes*—Continued

Stations	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Wisconsin:													
Number				1	4	1	2		2				10
Deaths				0	1	0	0		0				1
Injuries					3	0	1						[3] 4
Damage ($x1,000)				60.0	165.0	0.5	20.0		22.0				267.5
Wyoming:													
Number						[2] 2							[2] 2
Deaths						2							2
Injuries						6							6
Damage ($x1,000)						[9] 60.0							[9] 60.0
United States:													
Number	6	[2] 5	[2] 10	19	[3] 31	[3] 27	[2] 9	8	3	3	1	10	[2] 132
Deaths	9	9	[2] 111	86	36	46	0	0	0	29	0	7	[2] 333
Injuries	20	102	[2] 781	[3] 444	[3] 36	[3] 42	3	0		[2] 100	0	36	[2] 1,564
Damage ($x1,000)	64.0	[2] 1,760.0	[2] 1,893.3	3,862.0	[7] 1,538.7	1,100.0	[8] 721.7	[2] 0	27.0	515.4	2.5	221.0	[2] 11,705.6

[1] Press report.
[2] Probably more.
[3] Several injured.
[4] Many injured.
[5] Considerable damage.
[6] Several thousand dollars.
[7] Includes some hail and rain damage.
[8] Includes considerable straight-line wind damage.
[9] Part of a general storm.

TABLE 2.—*Tornadic winds and possible tornadoes*

Stations	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Alabama:													
Number	1												1
Deaths	0												0
Injuries	1												1
Damage ($x1,000)	5.0												5.0
Arkansas:													
Number										[1] 1			[1] 1
Deaths										0			0
Injuries										[3]			[3]
Damage ($x1,000)										[2] 15.0			[2] 15.0
Colorado:													
Number				1									1
Deaths				0									0
Injuries				0									0
Damage ($x1,000)				2.5									2.5
Kansas:													
Number						2			[2] 1				[2] 3
Deaths						0			0				0
Injuries													
Damage ($x1,000)						[5]			[5]				[5]
Louisiana:													
Number	3	1		1				1					6
Deaths	1	0		0				0					1
Injuries	4	0		4				0					8
Damage ($x1,000)	10.0	3.8		10.0				10.0					33.8
Minnesota:													
Number									1				1
Deaths													
Injuries													
Damage ($x1,000)									[5]				[5]
Oklahoma:													
Number				1		1				1			3
Deaths				0		0				0			0
Injuries				0		0				0			0
Damage ($x1,000)				3.0		8.0				5.0			16.0
South Carolina:													
Number			1				1						2
Deaths			0				0						0
Injuries			0				0						0
Damage ($x1,000)			2.5				25.0						27.5
South Dakota:													
Number								1					1
Deaths								0					0
Injuries								0					0
Damage ($x1,000)								7.0					7.0
Texas:													
Number	[1] 1			1									[2] 21
Deaths	0			1									1
Injuries	3			2									5
Damage ($x1,000)	[4]			3.0									[2] 6.0
United States:													
Number	5	1	1	4	0	3	1	2	[2] 2	[2] 2			[2] 21
Deaths	1	0	0	1		0	0	0		0			2
Injuries	8	0	0	6			0	0		[3]			[2] 14
Damage ($x1,000)	18.0	3.8	2.5	18.5		[2] 8.0	25.0	17.0	[4]	[2] 20.0			[2] 112.8

[1] Press report.
[2] Probably more.
[3] Several.
[4] Several thousand dollars.
[5] Reported in general storm.